Aniket Bera

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Areas of Interest:
Affective Computing, Computer Graphics (Locomotion Interfaces, Augmented and Virtual Reality), Multi-Modal Learning, Social Robotics, Cognitive modeling, Planning and Animation for Intelligent Characters

🎓 Education

2012 - 2017 PhD in **Computer Science**,
University of North Carolina at Chapel Hill
Advisor: Dinesh Manocha

2012 - 2016 MS in **Computer Science**,
University of North Carolina at Chapel Hill
Advisor: Dinesh Manocha

March 2012 B.Tech in **Computer Science and Engineering**,
Jaypee Institute of Information Technology University (JIIT), India

Professional Experience

2019 - Present **Assistant Research Professor**, University of Maryland at College Park
Appointments: Department of Computer Science (Affiliate),
University of Maryland Institute for Advanced Computer Studies (UMIACS),
Maryland Robotics Center (James Clark School of Engineering) (Affiliate)
Brain and Behavior Institute (BBI)(Affiliate)

2018 - 2019 **Research Assistant Professor**, University of North Carolina at Chapel Hill
Appointments: Department of Computer Science

2017 - 2018 **Postdoctoral Research Associate**, University of North Carolina at Chapel Hill

2012 - 2017 **Graduate Research Assistant** at University of North Carolina at Chapel Hill

Summer 2014 **Lab Associate** at Disney Research (Los Angeles)

Summer 2013 **Research Intern (Advanced Visual Computing)** at Intel Labs

💵 Grants/Funding

- **MII TEDCO *(PI)* [$365k] [*Under Review*]**
  Project Title: Dost: A smart virtual friend that can talk, interact, and feel, just like you!
- **Maryland Department of Health *(PI)* [$148k]**
  Project Title: The Resilience Project: Embodied Virtual Reality (VR) Agent Research to measure Adaptive Stress Response for individuals in a high-risk occupation
- **Army Research Lab ArtIAMAS 3.4 *(Co-PI)* [$1.15 million]**
  Project Title: Synthetic Human Generation (Perception-Based Teaming)
- **National Science Foundation (NSF 19-589 CISE) *(Co-PI)* [$120k]**
  Project Title: EAGER: CPR-Robot in Dense Areas
- **Brain and Behavior Institute Grant FY20 *(PI)* [$80k]**
  Project Title: Learning Age and Gender Adaptive Gait Motor Control based Emotion using Deep Neural Networks and Affective Modeling.

- **State of Maryland: MPower Grant 2020** ***(PI)*** **[$120k]**
  Project Title: Developing an Artificial Intelligence Tool to improve Caregiver Engagement for Rural Child Behavioral Health Services.
- **Army Research Lab ArtIAMAS 1.2** ***(Co-PI)*** **[$200k]**
  Project Title: Digital Terrain Reasoning
- **Department of Defense (DoD DURIP 2020)** ***(Co-PI)*** **[$225k]**
  Project Title: Support for Cloud-based Intelligent Virtual Reality (VR) Systems.
- **Maryland Department of Transportation** ***(Co-PI)*** **[$150k]**
  Project Title: Evaluation of Smart Pedestrian Crosswalk Technologies.
- **Army Research Lab ArtIAMAS 1.3** ***(Co-PI)*** **[$ 400k]**
  Project Title: Robot Navigation of Complex Terrain
- **UMMC Innovation Challenge** ***(Co-PI)*** **[*Under Review*]**
  Project Title: Alternate Reality: Using VR to improve patient stress management in inpatient Psychiatry units.

🏆 Selected Awards & Honors

- **Best Paper (Honorable Mention) at IEEE Virtual Reality 2022**: *ENI*: Quantifying Environment Compatibility for Natural Walking in Virtual Reality
- **Best Paper Award at IEEE Virtual Reality 2021**: *Text2Gestures*: A Transformer-Based Network for Generating Emotive Body Gestures for Virtual Agents
- **Best Journal Paper (Honorable Mention) at ISMAR 2021**: Redirected Walking in Static and Dynamic Scenes Using Visibility Polygons
- **Best Paper (Honorable Mention) at IEEE Virtual Reality 2021**: *ARC*: Alignment-based Redirection Controller for Redirected Walking in Complex Environments
- **University of Maryland: Invention of the Year Award 2021 (Nomination)**: Emotions Don't Lie: Audio-Visual Deepfake Detection using Affective Cues
- **University of Maryland: Invention of the Year Award 2020**: *M3ER*: Multiplicative Mulimodal Emotion Recognition using Facial, Textual, and Speech Cues
- **Best Poster Award at ACM Symposium of Applied Perception 2019**: Identifying Emotions from Walking using Affective and Deep Features
- **Best Presentation Award at ISMAR 2019**: Identifying Emotions from Walking using Affective and Deep Features
- **ACM Research Spotlight 2020**: This Robot Can Guess How You're Feeling by the Way You Walk
- **NSF Travel Grant Award: ICRA 2016**: GLMP-Realtime Pedestrian Path Prediction using Global and Local Movement Patterns
- **NSF Travel Grant Award: ICRA 2014**: AdaPT: Real-time Adaptive Pedestrian Tracking for Crowded Scenes
- **International Mathematics Olympiad 2017**: Gold Medalist

Patents Filed

- **Title:** Transformer-Based Networks for Generating Emotive Gestures for Virtual Entities
  U.S. Provisional Application No.: 63/263295
  Filing Date: October 29, 2021
- **Title:** Emotions Don't Lie: System for Detecting Fabricated Videos using Affective Cues
  U.S. Application No.: 17/515849
  Filing Date: October 30, 2020

- **Title:** System and Method for Multimodal Emotion Recognition
  Publication No.: 20210342656
  Publication Date: November 4, 2021

- **Title:** Human Emotion Recognition in Images or Video
  Publication No.: 20210390288
  Publication Date: December 16, 2021

📖 Publications *(Last 5 years)*

Total Citations: ***1641****, h-index:* ***22****, i10-index:* ***46***
(as of **4/25/2022**, for latest count, refer: ***Google Scholar***)

Publications Under-Review:

- AffectiveFlows: Co-Speech Affective Gesture Synthesis using Normalizing Flows-*Evar Jones, Chetan Alla, Jason FotsoPuepi,* ***Aniket Bera***

- Identifying Emotions from Walking Using Affective Features-*Tanmay Randhavane, Uttaran Bhattacharya, Kyra Kapsaskis, Pooja Manoj Kabra, Kurt Gray,* ***Aniket Bera***

- ABC-Net: Semi-Supervised Multimodal GAN-based Engagement Detection using an Affective, Behavioral and Cognitive Model- *Pooja Guhan, Naman Awasthi, Ritwika Das, Kathryn McDonald, Kristin Bussell, Dinesh Manocha, Gloria Reeves,* ***Aniket Bera***

- RAIST: Learning Risk Aware Agent Interactions via Spatio-Temporal Graph Convolutional Networks-*Videsh Suman,* ***Aniket Bera***

- EWareNet: Emotion Aware Human Intent Prediction and Adaptive Spatial Profile Fusion for Multi-Agent Navigation-*Venkatraman Narayanan, Bala Manoghar, Rama Prashanth,* ***Aniket Bera***

- SeekNet: Improved Human Instance Segmentation via Reinforcement Learning Based Optimized Agent Relocation-*Venkatraman Narayanan, Bala Manoghar, Rama Prashanth RV,* ***Aniket Bera***

Refereed Publications:

- Learning Unseen Emotions from Gestures via Semantically-Conditioned Zero-Shot Perception with Adversarial Autoencoders- *Abhishek Bhattacharya, Uttaran Bhattacharya,* ***Aniket Bera*** [AAAI Conference on Artificial Intelligence (**AAAI 2022**), Vancouver, Canada]

- 3MASSIV: Multilingual, Multimodal and Multi-Aspect Dataset of Social Media Short Videoss-*Vikram Gupta, Trisha Mittal, Puneet Mathur, Vaibhav Mishra, Mayank Maheshwari, Debdoot Mukherjee* ***Aniket Bera****, Dinesh Manocha* [AAAI Conference on Artificial Intelligence (**CVPR 2022**), New Orleans, USA]

- ENI: Quantifying Environment Compatibility for Natural Walking in Virtual Reality -*Niall Williams,* ***Aniket Bera****, Dinesh Manocha* [IEEE Virtual Reality (**VR 2022**), New Zealand] 🏆

- Redirected Walking in Static and Dynamic Scenes Using Visibility Polygons-*Niall Williams,* ***Aniket Bera****, Dinesh Manocha* [IEEE Transactions on Visualization and Computer Graphics (**TVCG**)],[IEEE International Symposium on Mixed and Augmented Reality (**ISMAR 2021**), Bari, Italy] 🏆

- Can a robot trust you? A DRL-based approach to trust-driven human-guided navigation-*Vishnu Sashank Dorbala, Arjun Srinivasan,* ***Aniket Bera*** [IEEE International Conference on Robotics and Automation (**ICRA 2021**)

- ARC: Alignment-based Redirection Controller for Redirected Walking in Complex Environments-*Niall Williams,* ***Aniket Bera****, Dinesh Manocha* [IEEE Transactions on Visualization and Computer Graphics (**TVCG**)],[IEEE Virtual Reality (**VR 2021**), Lisbon, Portugal] 🏆

- Text2Gestures: A Transformer Network for Generating Emotive Body Gestures for Virtual Agents-*Uttaran Bhattacharya, Nicholas Sergei Rewkowski, Pooja Guhan, Abhishek Banerjee,* ***Aniket Bera****, Dinesh Manocha* [IEEE Virtual Reality (**VR 2021**), Lisbon, Portugal] 🏆

- Affect2MM: Affective Analysis of Multimedia Content Using Emotion Causality- *Trisha Mittal, Puneet Mathur,* ***Aniket Bera****, Dinesh Manocha* [IEEE Conference on Computer Vision and Pattern Recognition (**CVPR 2021**), Nashville, USA]
- Multimodal and Context-Aware Emotion Perception Model with Multiplicative Fusion- *Trisha Mittal,* ***Aniket Bera****, Dinesh Manocha* [IEEE MultiMedia]
- Take an Emotion Walk: Perceiving Emotions from Gaits Using Hierarchical Attention Pooling and Affective Mapping- *Uttaran Bhattacharya, Christian Roncal, Trisha Mittal, Rohan Chandra, Kyra Kapsaskis, Kurt Gray,* ***Aniket Bera****, Dinesh Manocha* [European Conference on Computer Vision (**ECCV 2020**), Glasgow, United Kingdom]
- Emotions Don't Lie: An Audio-Visual Deepfake Detection Method using Affective Cues- *Trisha Mittal, Uttaran Bhattacharya, Rohan Chandra,* ***Aniket Bera****, Dinesh Manocha* [ACM Multimedia (**ACMMM 2020**), Seattle, United States]
- Generating Emotive Gaits for Virtual Agents Using Affect-Based Autoregression- *Uttaran Bhattacharya, Nicholas Rewkowski, Trisha Mittal, Rohan Chandra,* ***Aniket Bera****, Dinesh Manocha* [International Symposium on Mixed and Augmented Reality (**ISMAR 2020**), Pernambuco, Brazil]
- Forecasting Trajectory and Behavior of Road-Agents Using Spectral Clustering in Graph-LSTMs- *Rohan Chandra, Tianrui Guan, Srujan Panuganti, Trisha Mittal, Uttaran Bhattacharya,* ***Aniket Bera****, Dinesh Manocha* [RA-L Robotics and Automation Letters / IEEE International Conference on Robotics and Automation (**RA-L/IROS 2020**)]
- ProxEmo: Gait-based Emotion Learning and Multi-view Proxemic Fusion for Socially-Aware Robot Navigation- *Venkatraman Narayanan, Bala Murali Manoghar, Vishnu Sashank Dorbala, Dinesh Manocha,* ***Aniket Bera*** [IEEE International Conference on Robotics and Automation (**IROS 2020**)]
- CMetric: A Driving Behavior Measure using Centrality Functions- *Rohan Chandra, Uttaran Bhattacharya, Trisha Mittal,* ***Aniket Bera****, Dinesh Manocha* [IEEE International Conference on Robotics and Automation (**IROS 2020**)]
- Using Graph-Theoretic Machine Learning to Predict Human Driver Behavior- *Rohan Chandra,* ***Aniket Bera****, Dinesh Manocha* [IEEE Transactions on Intelligent Transportation Systems]
- EmotiCon: Context-Aware Multimodal Emotion Recognition using Frege's Principle- *Trisha Mittal, Pooja Guhan, Uttaran Bhattacharya, Rohan Chandra,* ***Aniket Bera****, Dinesh Manocha* [IEEE Conference on Computer Vision and Pattern Recognition (**CVPR 2020**), Seattle, USA]
- RoadTrack: Realtime Tracking of Road Agents in Dense and Heterogeneous Environments- *Rohan Chandra, Uttaran Bhattacharya, Tanmay Randhavane,* ***Aniket Bera****, Dinesh Manocha* [RA-L Robotics and Automation Letters / IEEE International Conference on Robotics and Automation (**RA-L/ICRA 2020**), Paris, France]
- GraphRQI: Classifying Driver Behaviors Using Graph Spectrums- *Rohan Chandra, Uttaran Bhattacharya, Trisha Mittal, Xiaoyu Li,* ***Aniket Bera****, Dinesh Manocha* [IEEE International Conference on Robotics and Automation (**ICRA 2020**), Paris, France]
- How are you feeling? Multimodal Emotion Learning for Socially-Assistive Robot Navigation - ***Aniket Bera****, Tanmay Randhavane, Kurt Gray, Kyra Kapsaskis, Austin Wang, Dinesh Manocha* [IEEE International Conference on Automatic Face and Gesture Recognition (**FG 2020**), Buenos Aires, Argentina]
- STEP: Spatial Temporal Graph Convolutional Networks for Emotion Perception from Gaits- *Uttaran Bhattacharya, Trisha Mittal, Rohan Chandra, Tanmay Randhavane,* ***Aniket Bera****, Dinesh Manocha* [AAAI Conference on Artificial Intelligence (**AAAI 2020**), New York, USA]
- M3ER: Multiplicative Multimodal Emotion Recognition Using Facial, Textual, and Speech Cues- *Trisha Mittal, Uttaran Bhattacharya, Rohan Chandra,* ***Aniket Bera****, Dinesh Manocha* [AAAI Conference on Artificial Intelligence (**AAAI 2020**), New York, USA]
- EVA: Modeling Perceived Emotions of Virtual Agents using Expressive Features of Gait and Gaze- *Tanmay Randhavane,* ***Aniket Bera****, Kyra Kapsaskis, Kurt Gray, Dinesh Manocha* [ACM Symposium on Applied Perception (**ACM SAP 2019**), Barcelona, Spain] 🏆

- DensePeds: Pedestrian Tracking in Dense Crowds Using FRVO and Sparse Features- *Rohan Chandra, Uttaran Bhattacharya,* ***Aniket Bera****, Dinesh Manocha* [IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2019**), Macau, China]

- TraPHic: Trajectory Prediction in Dense and Heterogeneous Traffic Using Weighted Interactions- *Rohan Chandra, Uttaran Bhattacharya,* ***Aniket Bera****, Dinesh Manocha* [IEEE Conference on Computer Vision and Pattern Recognition (**CVPR 2019**), Long Beach, USA]

- FVA: Modeling Perceived Friendliness of Virtual Agents Using Movement Characteristics- *Tanmay Randhavane,* ***Aniket Bera****, Kyra Kapsaskis, Kurt Gray, Dinesh Manocha* [IEEE Transactions on Visualization and Computer Graphics (**TVCG**)],[IEEE International Symposium on Mixed and Augmented Reality (**ISMAR 2019**), Beijing, China] 🏆

- Socially-aware Human Learning - ***Aniket Bera****, Tanmay Randhavane, Dinesh Manocha* [Multimodal Learning from Videos, IEEE Conference on Computer Vision and Pattern Recognition, **CVPR 2019**]

- Improving Social Human-Robot Teaming in Crowded Environments - ***Aniket Bera****, Tanmay Randhavane, Kurt Gray, Kyra Kapsaskis, Austin Wang, Dinesh Manocha* [Human-Robot Teaming Beyond Human Operational Speeds (*IEEE International Conference on Robotics and Automation,* ***ICRA 2019***), Montreal, Canada]

- The Emotionally Intelligent Robot: Socially-aware Human Prediction ***Aniket Bera****, Tanmay Randhavane, Kurt Gray, Kyra Kapsaskis, Austin Wang, Dinesh Manocha* [Long-term Human Motion Prediction Workshop 2019 & Human Movement Science for Physical Human-Robot Collaboration (*IEEE International Conference on Robotics and Automation 2019*), Montreal, Canada]

- Modeling Data-Driven Dominance Traits for Virtual Characters using Gait Analysis- *Tanmay Randhavane,* ***Aniket Bera****, Emily Kubin, Kurt Gray, Dinesh Manocha* [IEEE Transactions on Visualization and Computer Graphics (**TVCG** 2019)]

- Pedestrian Dominance Modeling for Socially-Aware Robot Navigation- *Tanmay Randhavane,* ***Aniket Bera****, Emily Kubin, Austin Wang, Kurt Gray, Dinesh Manocha* [IEEE/RSJ International Conference on Robotics and Automation (**ICRA 2019**), Montreal, Canada]

- PORCA: Modeling and planning for autonomous driving among many pedestrians - *Yuanfu Luo, Panpan Cai,* ***Aniket Bera****, David Hsu, Wee Sun Lee, Dinesh Manocha* [IEEE Robotics & Automation Letters (**RA-L 2018**)]

- Data-Driven Modeling of Group Entitativity in Virtual Environments - ***Aniket Bera****, Tanmay Randhavane, Emily Kubin, Husam Shaik, Kurt Gray, Dinesh Manocha* [ACM Symposium on Virtual Reality Software and Technology (**VRST 2018**), Tokyo, Japan]

- The Socially Invisible Robot: Navigation in the Social World using Robot Entitativity - ***Aniket Bera****, Tanmay Randhavane, Emily Kubin, Austin Wang, Kurt Gray, Dinesh Manocha* [IEEE/RSJ International Conference on Intelligent Robots (**IROS 2018**), Madrid, Spain]

- LCrowdV: Generating labeled videos for pedestrian detectors training and crowd behavior learning - *Ernest Cheung, Tsan Kwong Wong,* ***Aniket Bera****, Dinesh Manocha* [**Neurocomputing 2019**]

- Classifying Driver Behaviors for Autonomous Vehicle Navigation -*Ernest Cheung,* ***Aniket Bera****, Emily Kubin, Kurt Gray, Dinesh Manocha* [*Towards Intelligent Social Robots* (IEEE/RSJ International Conference on Intelligent Robots 2018), Madrid, Spain]

- Socially Invisible Navigation for Intelligent Vehicles - ***Aniket Bera****, Tanmay Randhavane, Emily Kubin, Austin Wang, Kurt Gray, Dinesh Manocha* [*Workshop on Planning, Perception and Navigation for Intelligent Vehicles* (IEEE/RSJ International Conference on Intelligent Robots, **IROS 2018**), Madrid, Spain]

- Automatically Learning Driver Behaviors for Safe Autonomous Vehicle Navigation -*Ernest Cheung,* ***Aniket Bera****, Emily Kubin, Kurt Gray, Dinesh Manocha* [*Workshop on Planning, Perception and Navigation for Intelligent Vehicles* (IEEE/RSJ International Conference on Intelligent Robots, **IROS 2018**), Madrid, Spain]

- MixedPeds: Pedestrian Detection in Unannotated Videos using Synthetically Generated Human-agents for Training - *Ernest Cheung, Anson Wong,* ***Aniket Bera****, Dinesh Manocha* [**AAAI 2018**, Louisiana, USA]
- Identifying Driver Behaviors using Trajectory Features for Vehicle Navigation - *Ernest Cheung,* ***Aniket Bera****, Emily Kubin, Kurt Gray, Dinesh Manocha* [IEEE/RSJ International Conference on Intelligent Robots (**IROS 2018**), Madrid, Spain]
- F2FCrowds: Planning agent movements to enable face-to-face interactions - - *Tanmay Randhavane,* ***Aniket Bera****, Dinesh Manocha* [**Presence: Teleoperators & Virtual Environments, 2018**]
- Aggressive, Tense, or Shy? Identifying Personality Traits from Crowd Videos - ***Aniket Bera,*** *Tanmay Randhavane, Dinesh Manocha* [International Joint Conference on Artificial Intelligence (**IJCAI 2017**), Melbourne, Australia]
- SocioSense: Robot Navigation Amongst Pedestrians with Social and Psychological Constraints - ***Aniket Bera****, Tanmay Randhavane, Dinesh Manocha* [IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2017**), Vancouver, Canada]
- Interactive Crowd-Behavior Learning for Surveillance and Training - ***Aniket Bera****, Sujeong Kim, Dinesh Manocha* [IEEE Computer Graphics and Applications, Special Edition (**CG&A 2016**)]
- Online parameter learning for data-driven crowd simulation and content generation - ***Aniket Bera,*** *Sujeong Kim, Dinesh Manocha* [**Computers & Graphics Journal 2016**]

Book Chapter:

- Realtime Pedestrian Tracking and Prediction in Dense Crowds - ***Aniket Bera****, David Wolinski, Jullian Pettre, Dinesh Manocha* [Book Chapter on Group and Crowd Behavior for Computer Vision, 2018]

Invited Talks

- Designing Emotionally-Intelligent Agents that Move, Express, and Feel Like Us! - ***Cornell University, Ithaca, USA (2022)***
- Designing Emotionally-Intelligent Digital Humans that Move, Express, and Feel Like Us! - ***University of Texas at Austin (UT Austin), Texas, USA (2021)***
- Learning Affective 3D Human Gaits and Gestures -***3DGV Seminar (Online) (2021)***
- ARC: Alignment-based Redirection Controller for Redirected Walking in Complex Environments -***SIGGRAPH Invited Talk (2021)***
- Digital humans that move, interact and feel, just like us! -***University of Pennsylvania (UPenn), Philadelphia, USA (2021)***
- Designing Emotionally-Intelligent Agents: Modeling Human Affect, Interactions, and Collaborations -***University of Wisconsin-Madison (UW-M), Madison, USA (2021)***
- Designing Emotionally-Intelligent Virtual Characters -***Texas A&M University (TAMU), Texas, USA (2021)***
- Using Multimodal Behavior AI for Mental Health -***University of Maryland Baltimore Medical Center Event, Baltimore, USA (2020)***
- Can your robot know what you're feeling? -***Kaziranga University, Assam, India (2020)***
- The Future of Social Robotics -***Indian Institute of Technology Delhi (IIT-D), India (2019)***
- Social Prediction for Mutltiagent and Robot Systems -***National University of Singapore (NUS), Singapore (2018)***
- The Emotionally Intelligent Robot: Improving Social Human-Robot Teaming -***Indraprastha Institute of Information Technology Delhi (IIIT), India (2019)***

- Generating Labeled Videos for Simulation-based Crowd Behavior Learning -***European Conference on Computer Vision Workshop, Amsterdam, Netherlands (2016)***
- Classifying Group Emotions for Socially-Aware Autonomous Vehicle Navigation - ***IEEE Conference on Computer Vision and Pattern Recognition Workshops, Utah, USA (2018)***
- Interactive Surveillance Technologies for Dense Crowds - ***Association for the Advancement of Artificial Intelligence Fall Symposium Series 2018 (Artificial Intelligence in Government and Public Sector), Virginia, USA (2018)***
- Behavior Modeling for Autonomous Driving - ***Association for the Advancement of Artificial Intelligence 2018 Fall Symposium Series (Reasoning and Learning in Real-World Systems for Long-Term Autonomy), Virginia, USA (2018)***
- Group and Crowd Behavior for Computer Graphics and Robotics Applications - ***Delhi Technological University (DTU), India (2015)***
- Tracking Dense Crowds using GPGPUs -***Intel Event, Oregon, USA (2013)***

Public Datasets

- *Simulated pedestrian dataset with varying crowd density, population, lighting conditions, background scene, camera angles, agent personality and noise level to help in training models for crowd understanding, including pedestrian detection, crowd classification, etc.* Link: `http://gamma.cs.unc.edu/LCrowdV/#dataset`
- *A public domain dataset, EWalk, with videos of walking individuals. We also provide their gaits in the form of 3D positions of 16 joints and labeled emotions obtained using a perception study.* Link: `http://gamma.cs.unc.edu/GAIT/#EWalk`
- *Emotion-Gait is a dataset consisting of human gaits annotated with 4 emotion labels: angry, happy, neutral and sad. It consists of 2,177 real gaits and 4,000 synthetic gaits. Of the 2,177 real gaits, 342 were collected by and the remaining 1,835 were taken from the [Edinburgh Locomotion Mocap Database (ELMD)]*
  Link: `https://gamma.umd.edu/researchdirections/affectivecomputing/step`
- *High resolution crowd dataset captured in dense pedestrian crossings in India. Dataset consists of videos of indoor and outdoor scenes recorded at different locations, each with 30-80 pedestrians.*
  Link: `http://gamma.cs.unc.edu/RCrowdT/`
- *A traffic dataset (TRAF) comprising of dense and heterogeneous traffic. The dataset consists of the following road-agents: cars, busses, trucks, rickshaws, pedestrians, scooters, motorcycles, carts, and animals and is collected in dense Asian cities.*
  Link: `https://go.umd.edu/TRAF-Dataset`
- *A dense crowd dataset (DensePeds) captured in dense crowd and multi-agent environments. The dataset contains detailed labels and trajectories for dense crowd scenes.*
  Link: `https://www.gamma.umd.edu/researchdirections/autonomousdriving/densepeds/`

Professional Service

- **Conference Chair**: *ACM SIGGRAPH MIG 2022*
- **Associate Editor**: *IROS 2020, 2021, ICRA 2022*
- **Session Chair:** Navigation and Collision Avoidance in *IROS 2020, 2021*
- **Session Chair:** Crowds & Perception in *IEEE Virtual Reality 2020*
- **Session Chair (3 Sessions):** (i) Human Modeling, (ii) Cognitive Modeling, (iii) Vision: Tracking and Detection in *AAAI 2020*
- **Session Chair:** Human Detection and Tracking in *ICRA 2019*
- **Program Committee** in *IEEE VR 2018, 2019, 2020, 2021*

- **Program Committee** in *AAAI 2018, 2019, 2020*
- **Program Committee** in *IJCAI 2018, 2019, 2020*
- **Panel** for *National Science Foundation* ***(NSF) (Information & Intelligent Systems Division (IIS) 2021)***
- **Grant Reviewer/Panel** for *American Association for the Advancement of Science* (***Reviewed 6 Proposals*** *- RDO-ICG (International Collaboration Grant) 2018/2019)*
- **Grant Reviewer/Panel** for *Estonian Research Council 2020:* (***Reviewed 2 Research Proposals****)*

Reviewer: **ICRA** (2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021), **IROS** (2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021), **ACM CHI** (2018, 2019), **IEEE R-AL** (2016, 2017, 2018, 2019, 2020), **AAAI** (2018, 2019, 2020), **IJCAI** (2017, 2019, 2020), **SIGGRAPH** (2019, 2020), **SIGGRAPH Asia** (2019, 2020), **ACM ToG** (2017, 2018, 2019), **IJRR** (2016, 2017, 2018, 2019), **Computers & Graphics** (2018), **Computer Graphics & Applications** (2018), **Applied Mathematical Modelling** (2018), **ACM TAP** (2018, 2019), **IEEE TPAMI** (2018, 2019),**IEEE VR** (2016, 2017, 2018, 2017, 2019, 2020, 2021), **IEEE Transactions on Multimedia** (2018, 2019, 2020), **PLOS ONE** (2017, 2018, 2019), **Autonomous Robots** (2020), **Multimodal Technologies and Interaction** (2020), **Computer Graphics Forum** (2019, 2020), **Sensors** (2017, 2018), **Journal of Imaging** (2017)

Current and Prior Diversity Activities

1. I am my department's official faculty representative for the **University of Maryland Diversity and Inclusion Advisory Council 2021-2022** to re-vitalize our diversity and inclusion efforts. (Link: **https://cmns.umd.edu/about-cmns/diversity-inclusion**)
2. Lead for one the projects at "**Tech+Research**" Workshop which hopes to give undergraduate CS students who identify as an underrepresented gender in computing an opportunity to learn about future computer science research opportunities and to provide hands-on experience engaging in CS research (Link: **https://inclusion.cs.umd.edu/events/techresearch**).
3. I was the President of the **Computer Science Student Association (CSSA)** for the year **2016-2017** during my graduate education at the University of North Carolina (UNC). I represented all graduate students from different cultural backgrounds, mentored international students, negotiated salaries and benefits, and represented student issues with the faculty. I also organized and invited faculty and companies for talks.
4. As a research faculty member at UNC, I was a part of the search/hiring committee (five members) for a new **Diversity Coordinator position** in 2018, which was a major initiative to increase the racial and gender diversity in the undergraduate and graduate programs at UNC.
5. I also represented the department at the **Graduate and Professional Student Federation (GPSF)** meetings and discussed various student issues/solutions.
6. I organized the annual **Maze Day** at UNC with other faculty, inviting **students with visual impairments** to the department to experience a wide variety of educational tools and opportunities designed just for them. I also helped raise corporate sponsorship for this endeavor.

Teaching Record

Courses

- *Metaverse and Virtual Reality (Interprofessional Education Course) UMCP and UMB, 2021*
- *CMSC 818N - Advanced Topics in Computer Systems; 2021* (Guest Instructor)
- *COMP 790-058: Autonomous Agents and Multi-Agent Simulation for Crowds, 2017*
- Teaching Assistant for *COMP 116: Introduction to Scientific Programming, 2013* and '*COMP 581: Introduction to Robotics, 2014*'
- Multiple students (current and past) have enrolled in the '*Advanced Topics in Engineering*' course and the '*Pathway to the Ph.D.*' program with me as their faculty instructor/advisor. These courses give students the opportunity to do an independent research project on a topic relevant to their academic program and are supervised by a faculty.

Student Supervision

Graduate students

- **Vishnu Sashank Dorbala** *[Primary PhD/MS Advisor]*
- **Pooja Guhan** *[Primary PhD/MS Advisor]*
- **Niall Williams** *[PhD Co-Advisor]*
- **Rama Prashanth** *[Primary PhD/MS Advisor]*
- **Arjun Ambalam** *[Primary MS Advisor]*
- **Pooja Kabra** *[Primary MS Advisor]*
- **Bala Sai Sudhakar** *[Primary MS Advisor]*
- **Arpit Maclay**
- **Abhishek Banerjee** *[Primary MS Advisor]*
- **Videsh Suman** *(University of Massachusetts Amherst)*
- **Venkatraman Narayanan** *[Primary MS Advisor]*
- **Rohan Chandra** *[PhD Committee]*
- **Uttaran Bhattacharya** *[PhD Committee]*
- **Trisha Mittal** *[PhD Committee]*
- **Janakiraman Kirthivasan** (Former student)*[Primary MS Advisor]*
- **Tianrui Guan** *[MS Committee]*
- **Jack Sturtevant** (Former student)
- **Ernest Cheung** (Former student)*[Primary MS Advisor]*
- **Tanmay Randhavane** (Former student)*[PhD Committee]*
- **Vasavi Gajarla** (Former student) *[Primary MS Advisor]*
- **Rohan Prinja** (Former student) *[Primary MS Advisor]*
- **Aditya Murthy** *(Chalmers University of Technology, Sweden)*

Undergraduate students

- **Jiayi Xu (April)**
- **Chetan Alla**
- **Jason Fotso**
- **Ritwika Das**
- **Austin Wang** (Former student)
- **Mehul Arora** *(Indian Institute of Information Technology Allahabad, India)*
- **Rahul Madhogarhia** *(National Institute of Technology Karnataka, India)*
- **Anson Wong** (Former student)
- **Changhao Liu** (Former student)
- **Husam Shaik** (Former student)
- **Josh Taekman** (Former student)

Media/News Coverage

- "This Robot Can Guess How You're Feeling by the Way You Walk" - ***WIRED***.
  Link: **https://www.wired.com/story/proxemo-robot-guesses-emotion-from-walking/**
- "ProxEmo: Can AI Detect Your Emotion Just By How You Walk?" - ***Forbes***.
  Link: **https://www.forbes.com/sites/cognitiveworld/2020/03/29/can-ai...**
- "UMD Researchers: Could Robots Prevent Spread Of COVID-19" - ***CBS/TV***.
  Link: **https://baltimore.cbslocal.com/video/4702853-umd-researchers-could...**
- "There's a new AI that can guess how you feel just by watching you walk" - ***Fast Company***.
  Link: `https://www.fastcompany.com/90375885/`
- 'Identifying perceived emotions from people's walking style" - ***Tech Xplore***.
  Link: `https://techxplore.com/news/2019-07-emotions-people-style.html`

- “Indian Researcher & His Team Build AI That Can Tell How We Feel Just By Seeing Us Walk” - ***Times of India***.
  Link: **https://www.indiatimes.com/technology/science-and-future/...**
- “AI uses camera footage to track pedestrians in dense crowds” - ***VentureBeat***.
  Link: **https://venturebeat.com/2019/06/26/ai-uses-camera-footag....**
- “Detecting Emotion Through Gait” - ***AI Today Podcast***.
  Link: **https://www.cognilytica.com/2020/05/06/ai-today-podcast-141-...**
- “Emotions Can Be Predicted From A Person’s Walking Style: Scientists Develop Algorithm” - ***International Business Times***.
  Link: **https://www.ibtimes.com/emotions-can-be-predicted-persons-walking...**
- “AI identifies human emotion based on walking style” - ***Medium***.
  Link: **https://medium.com/artificial-intelligence-network/ai-identifies...**
- “A path for all walks of life!” - ***Ideas & Discoveries***.
  Link: `https://www.pressreader.com/usa/id-magazine/20190901/282544429866813`
- “AI classifies people’s emotions from the way they walk” - ***VentureBeat***.
  Link: **https://venturebeat.com/2019/07/01/ai-classifies-peoples-emotions...**
- “Ready, Set, Brake!” - ***Association of American Universities / UNC***.
  Link: **https://www.aau.edu/research-scholarship/featured-research-topics...**
- “AI uses camera footage to track pedestrians in dense crowds” - ***VentureBeat***.
  Link: **https://venturebeat.com/2019/06/26/ai-uses-camera-footage-to...**
- “New Computer Science Building unveiled on Maryland Day” - ***The Sentinel***.
  Link: **https://pgs.thesentinel.com/2019/05/02/new-computer-science-building...**
- “New software can track many individuals in a crowd” - ***Science***.
  Link: **https://www.sciencemag.org/news/2017/04/new-software-can-track...**
- “Une nouvelle intelligence artificielle peut deviner les sentiments des gens en les regardant marcher” - ***Tuxboard (French)***.
  Link: **https://www.tuxboard.com/une-nouvelle-intelligence-artificielle-peut-devi..**
- “Restoring Pather Panchali is not a violation of authorship and sanctity” - ***Malayala Manorama***.
  Link: **https://english.manoramaonline.com/entertainment/entertainment-news...**
- “The colour of film nostalgia” - ***DailyO***.
  Link: **https://www.dailyo.in/arts/film-colourisation-pather-panchali-satyajit...**
- “রঙীন হল ‘পথরে পাঁচালী’” - ***EiSamay (Bengali)***.
  Link: **https://eisamay.indiatimes.com/entertainment/cinema/pather-panchali...**
- “Satyajit Ray की आइकॉनकि फल्मि Pather Panchali को रंगीन बनाने पर मचा ववािद, अनकित बेरा ने इस तकनीक पर की बात” - ***Patrika (Hindi)***.
  Link: **https://www.patrika.com/bollywood-news/satyajit-ray-pather-pancha...**
- “"ক্লাসকিকে ছোঁয়ার প্রয়োজন নইে", বতির্কে রঙনি পথরে পাঁচালী -”***The Indian Express (Kolkata Edition)***.
  Link: **https://bengali.indianexpress.com/entertainment/coloured-version...**
- “**കളറിലൊരുങ്ങി പഥരേ പാഞ്ചാലിയുടെ രംഗങ്ങൾ** -”***Samayam (Malayalam)***.
  Link: **https://malayalam.samayam.com/video-gallery/cinema/satyajit-ray-s-...**
- “‘পথরে পাঁচালী’র শরীরে নতুন রঙ -”***ETV (Bengali)***.
  Link: https://www.ekushey-tv.com/‘পথরে পাঁচালী’র শরীরে নত-...
- “L’IA qui peut reconnaître l’humeur d’une personne en analysant sa démarche” - ***Neon Magazine (French)***.
  Link: **https://www.neonmag.fr/lia-qui-peut-reconnaitre-lhumeur-dune..**

- "রঙগীন পথরে পাঁচালী -"***SNewz (Bengali)***.
  Link: **https://snewz.in/pather-panchali-in-color/54152/**
- "AI mới này có thể đoán cảm giác của con người thông qua dáng đi)" - ***Genk (Vietnamese)***.
  Link: **http://genk.vn/ai-moi-nay-co-the-doan-cam-giac-cua-con-nguoi....**
- "রঙনি 'পথরে পাঁচালী' নয়িে যত কাণ্ড -"***Priyo, Prothomalo (Bengali)***.
  Link: https://www.prothomalo.com/onnoalo/prose/রঙনি-'পথরে-পাঁচালী'-নয়িে-যত-ক
- "'পথরে পাঁচালী'তে রঙ, সাশে্যাল মডিয়িায় মশি্র প্রতক্রিয়িা -"***Bangi News (Bengali)***.
  Link: **http://www.banginews.com/web-news...**
- "আমার কাছে 'পথরে পাঁচালী' সাদাকালো ছবি হসিবেইে ম্যাজকিাল থাকবে -"***Anadabazaar Patrika (Interview)***.
  Link: **https://www.anandabazar.com/entertainment/aniket-bera-opens-up-on...**
- "Pather Pachali restored in colour" - ***Dhaka Tribune***.
  Link: **https://www.dhakatribune.com/showtime/2020/06/01/watch-pather-pachali...**
- "Cientistas ensinaram IA a perceber como nos sentimos pela nossa forma de andar" - ***ZAP aeiou (Portuguese)***.
  Link: **https://zap.aeiou.pt/cientistas-ensinaram-ia-perceber-nos-sentimos-pela...**
- "Contemporary directors open to Pather Panchali coloration experiment but swear by Ray classic" - ***Cinestaan***.
  Link: **https://www.cinestaan.com/articles/2020/jun/3/25869/contemporary...**
- "Pather Panchali, A Satyajit Ray Film, Recreated By US-based AI Professor" - ***Republic TV***.
  Link: **https://www.republicworld.com/entertainment-news/regional-indian-cinema/pather...**
- "Professor defends colourisation of Satyajit Ray's 'Pather Panchali' as 'academic experiment'" - ***Scroll.in***.
  Link: **https://scroll.in/reel/963474/professor-defends-colourisation-of-satyajit...**
- "Other Print Media and TV features/articles related to Pather Panchali" - ***UMD WWW***.
  Link: **http://www.cs.umd.edu/ ab/PatherPanchali**
- "Colouring Ray's Pather Panchali: Cultural Icons Not Under Attack" - ***The Indian Express***.
  Link: **https://indianexpress.com/article/entertainment/regional/iconic-satyajit...**
- "US-based Artificial Intelligence Professor colours 'Pather Panchali' as quarantine experiment" - ***The Quint***.
  Link: **https://www.thequint.com/entertainment/indian-cinema/colouring-rays-pather-panchali...**
- "Iconic Satyajit Ray film Pather Panchali gets a controversial touch of colour" - ***The Indian Express***.
  Link: **https://indianexpress.com/article/entertainment/regional/iconic-satyajit...**
- "Many-splendoured thing: A classic in polychrome as quarantine experiment" - ***The Telegraph (Editorial Board)***.
  Link: **https://www.telegraphindia.com/opinion/part-of-satyajit-ray-pather...**
- "US-based Bengali prof uses AI to restore earliest surviving film of India" - ***Times of India***.
  Link: **https://timesofindia.indiatimes.com/city/kolkata/us-based-bengali-prof-uses-ai...**
- "Researchers Collaborate to Address COVID-19" - ***UMB News***.
  Link: **https://www.umaryland.edu/news/archived-news/september-2020/researchers.....**
- "UMIACS Faculty Receive MPower Funding to Improve Mental Telehealth Services Using AI" - ***UMIACS News***.
  Link: **https://www.umiacs.umd.edu/about-us/news/umiacs-faculty-receive...**
- "Sci-Fi Social Distancing?" - ***Maryland Today***.
  Link: **https://today.umd.edu/articles/sci-fi-social-distancing-...**
- "A New Meaning for Mental Health 'Screening'" - ***Maryland Today***.
  Link: **https://today.umd.edu/articles/new-meaning-mental-health...**